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are made available to him who would work and has the requisite capacity.

All these advantages will, however, count for nothing if zoological research does not attract the best men, and if the best men be not accorded time and means for research. Our best students slip from our grasp to go into other professions or into commerce because we can offer them no outlook but teaching, administration, and a salary regulated by the law of supply and demand. We must urge without ceasing upon college trustees and corporations the necessity of freedom for research and liberal salaries if America is to contribute her share to the advance of zoology in the twentieth century.

CHAS. B. DAVENPORT.

UNIVERSITY OF CHICAGO.

SCIENTIFIC BOOKS.

Leçons de physiologie expérimentale. By M. RAPHAEL DUBOIS, professor in the University of Lyons, with the collaboration of M. EDMOND COUVREUR. Paris, Georges Carré et C. Naud. Pp. vi + 380.

These lessons in experimental physiology constitute a course of demonstrations, or lectures illustrated by demonstrations, given successfully by Professor Dubois and his pupil and collaborator, M. Couvreur, to the students in physiology of the faculty of sciences of the University of Lyons. As the authors state in the preface, they are now published with the view "of relieving the students attending the demonstrations from the necessity of taking notes, so that they may be able to devote to what they see the greatest amount of attention possible." In addition to viewing the demonstrations, the students are expected to repeat for themselves, under the direction of a master, all the classical experiments. For those who do not possess the advantage of expert supervision it is intended that the exercises described shall serve as a guide by the aid of which they may acquire a practical knowledge of physiology.

While it is encouraging to learn that some-

thing is being done to improve the teaching of practical physiology in the countries of continental Europe, where hitherto it has in general scarcely entered as a factor of any importance into the education of the student of science and particularly of medicine, we doubt whether there is a single teacher of experience in America or England who would bestow an unqualified approval upon the method adopted in this book. At the same time we can most heartily congratulate the young gentlemen (and ladies, if such there be,) of Lyons whom it releases from the bondage of the note-book and the pencil, and whose eyes and fingers (*facile princeps* in the armamentarium of physiology) it sets free for the practical study of this fascinating science.

Two well-established methods of imparting a practical knowledge of the subject are in vogue among us in schools of good standing; demonstrations by a teacher to small classes of students and practical exercises performed by the students themselves. Each of these methods has its uses, although for most purposes, and wherever the number of students is not unmanageably large, the second is by far the most satisfactory. The French lesson in experimental physiology, as typified in the Lyons course, is neither a demonstration pure and simple nor an exercise calculated to guide the student in individual practical work. It is rather a lecture on some portion of physiology, with a certain amount of actual demonstration or of talk about instruments and methods 'shoved into the belly of it.' Not full enough for systematic lectures, not precise enough in the practical directions, nor arranged with sufficient simplicity and order to be of much use as a laboratory guide, such hybrid disquisitions are neither likely, we fear, to thoroughly instruct the learner in the facts of the science nor to introduce him to a real knowledge of the methods by which the facts have been ascertained.

But when this has been said, criticism has exhausted its quiver. Faulty as is the plan of these lessons for the purposes of the elementary student, they are capable of being used with much advantage by teachers of practical physiology whom they will supply, in a somewhat

smaller compass and at a much smaller expense, with the kind of information contained in the classical 'Methodik' of Cyon, now, we believe, out of print. The advanced student also, who is able to pick and choose and piece together the information suited for his purpose, may derive considerable benefit by using the book as a supplement to other less copious but more systematically arranged manuals of practical instruction.

Beginning with the principles and technical details of the most common graphic methods of recording, the authors describe in succession the methods of fixation and anæsthetization of the animals employed; the precautions necessary for aseptic operations; the general properties of nerves and nerve centers, including the various kinds of excitation, reflex action and the effects of lesions of the brain and bulb; the general properties of muscles, illustrated by the usual myographic experiments; the mechanical, nervous and chemical phenomena of respiration in mammals, birds, reptiles and other animal groups; the mechanical and nervous phenomena of the circulation; the chemistry of the blood, lymph, the digestive juices and urine. The last lesson is devoted to animal heat. The least successful part of the book is that occupied with the chemistry of the secretions, a subject already well treated from the practical standpoint in numerous works suitable for students. The descriptions of apparatus are clear and sufficiently full, and the illustrations are well executed. In this age of blatant 'patriotism' it would seem futile to quarrel with the almost exclusive selection of French instruments and the almost exclusive citation of French authorities. In any case, if the authors have erred in this respect, their fault will be readily condoned in view of the charming naïveté of their explanation.

In matters of detail it is, of course, always easy for the captious critic to pick holes in any book. The slips and blunders in this, apart from what we think the initial vice of its plan, are neither numerous nor serious, and some of them have been corrected in a table of errata.

In the description of the action of strychnine (p. 163) the student might easily suppose, from the context that in an animal poisoned with

this drug a single direct excitation of a muscle or nerve 'produces not a single contraction but a series of contractions more or less fused.' This is true, of course, only of a reflex excitation.

The statement (on p. 196), that "after double section of the pneumogastric death always takes place as a direct or indirect consequence of asphyxia (phénomènes asphyxiques) more or less rapid," is misleading.

On p. 231, the so-called 'total velocity of the circulation,' for which a better term is the mean circulation time, is not accurately defined. The only method of measuring it described is the antiquated one of Hering.

On p. 249, the automaticity of the heart-beat is attributed to the ganglia without qualification and without any indication that the majority of physiologists who, in recent times, have busied themselves with researches on this subject have come to the opposite conclusion.

We are entirely unaware of the existence of evidence sufficiently clear to justify the conclusions so boldly drawn from Stannius' experiment on p. 251, 'that the ganglia of Bidder constitute an insufficient excito-motor center, the ganglion of Remak a sufficient excito-motor center, and the ganglia of Ludwig (in the auricular septum) an excito-inhibitory center whose tonus is by itself insufficient to counterbalance the excito-motor action of Remak's ganglion.'

On p. 267 it is stated that crystallized hæmoglobin (*i. e.*, reduced hæmoglobin) is unknown. Several competent authorities have described such crystals.

On p. 271, the band of reduced hæmoglobin is, for the English reader, rather comically disguised under the appellation, 'bande de Stokes,' meaning, of course, the 'band of Stokes.'

While the general rules laid down for operations on mammals and for the use of anæsthetics will, as a whole, commend themselves to all physiologists who have had much experience in the use of warm-blooded animals for teaching purposes, we must take exception to the advice that "in all operations, whether the animal is destined to be sacrificed at the end of the experiment or not, the vivisector should

apply as vigorously as the surgeon the rules of antiseptis and asepsis." We are convinced that while, in an experimental course carried out by students, it is perfectly feasible and of great utility to insist upon rigid antiseptic precautions in such experiments as require it, they not only introduce an unnecessary complication in cases in which the animal is to be sacrificed, but often interfere seriously with, and always distract the attention of the student from the real object of the observation. Further, most of the work on mammals which can and ought to be performed by students is of such a nature that a strict adherence to antiseptic technique throughout the whole experiment is practically impossible. If the argument that "it is a bad discipline to have two styles of operation, since certain details of the antiseptic method will be fatally neglected when one wishes in exceptional cases to apply it," be a sound one, we ought seriously to enquire whether the reckless custom of wearing one sort of dress in summer and another in winter is not very likely to result in a fatal confusion of times and seasons, muslins and mackintoshes, shirt-waists and sealskin coats, and to lead to such awful inversions as ducks in December and ulsters in July, or whether any man who respects his stomach and has a conscientious regard for the interests of his insurance company, can afford to permit his cook to dabble at the same time in the cumulative mysteries of roast and boiled.

G. N. I. S.

The Home Life of Wild Birds. A New Method of the Study and Photography of Birds. By FRANCIS HOBART HERRICK. New York and London, G. P. Putnam's Sons. 1901. Pp. xiii + 148.

In 'The Home Life of Wild Birds,' Francis Hobart Herrick has given us a most valuable treatise and one which is sure to be of the greatest assistance to those who are following the perplexing pastime of bird photography. The author states the truth when he says that animals should be studied as animals and not as if they were human beings. If some others had shared this commendable belief, an enormous amount of trash would be absent from the book shelves and consequently seekers

of truth would be saved a corresponding amount of annoyance. We have no objection to well-written fairy tales, fables, or stories of personified animals, but when an author states or implies that his human thinking and acting animals are truthfully portrayed, and the alleged facts are taken from nature, then we consider he should be most severely criticised.

Taking advantage of that force which for convenience we term parental instinct, Mr. Herrick overcomes the chief difficulty that besets the bird photographer. The method is to remove the nest from its surroundings, whether it be in the tall tree, deep wood, swamp or impenetrable brier patch, and set it up in a good light, so that the branch or other support of the nest will occupy the same relative position as in the old site. It was found that the parent birds soon got used to the new surroundings and attended the young as if nothing unusual had happened. By the aid of a green tent which concealed the operator and outfit, and when in use was open only at a point in line with the lens, the affairs of the little family could be observed with perfect ease at a distance of only a few feet. In this manner the author spent what must have been many happy days in observing the interesting movements that were taking place in and about the nests of the robin, cedarbird, kingbird, chestnut-sided warbler, bluebird, brown thrasher, red-eyed vireo, nighthawk and many other species.

The 137 pages which detail these experiments are full of valuable facts and suggestions and will surely be welcomed by those who care to learn the mysteries of bird life. The numerous photographs which enliven the book, with the exception of a few distorted on account of the nearness of the object, are admirable, and in connection with the text undoubtedly will stimulate many to seek a fascinating recreation so well described and illustrated in this volume.

A. K. F.

WASHINGTON, D. C.

DISCUSSION AND CORRESPONDENCE.

THE COAST PRAIRIE OF TEXAS.

THIS physiographic feature, which extends for a distance of nearly four hundred miles, from